### Healthcare Informatics Standards Board

# United States Health Information Knowledgebase (USHIK)

Metadata Registry Project

20 August 2001

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### Preview

- Provide Background and Status of Metadata Registry Project
- Review
  - Vision
  - Current Status
  - Metadata Registry Overview
  - Future
- Demonstration

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### What is national health information?

National health information is information that either is national in coverage or has national relevance and relates to:

- the <u>health of the population</u>
- the <u>determinants of the population's health</u>, including external factors and those internal to individuals
- <u>health programs or health services</u>, covering information on the nature of the services provided and their management, resourcing, accessibility, use and effectiveness
- the <u>relationships</u> among these elements.

## Why is it needed?

- Health information is needed by consumers and providers of health services, the health industry, governments and the community to <u>enable informed decision making</u>.
- <u>Consumers need information</u> to guide their decisions to seek care, modify their behaviour, choose between different treatment options and understand the care they are receiving.
- <u>Providers of health services need information</u> about the needs of the populations they serve, the effectiveness of their interventions and for whom they are effective, and the acceptability of these interventions to the community.
- Providers also require nationally consistent information to be able to <u>compare the effectiveness and efficiency</u> of their operations with those of their peers.
- The health industry and governments need information to make decisions about how to provide services equitably, efficiently and effectively, and to monitor health service financing, performance and health outcomes

# Why a metadata registry for health?

• To provide a common vocabulary and architecture for health information in America that will enable better quality health information to be produced, which will, in turn, result in better health for Americans

# Metadata Registry Project

Vision: To provide and maintain a metadata registry of health information data element definitions, values, and information models which will enable browsing, comparison, synchronization, and harmonization within a uniform query and interface environment.

## Metadata Registry Project

**Scope:** The registry will be initially populated with the data elements and information models of Standards Development Organizations (SDO), in such as way that public and private organizations can harmonize their information formats with SDO driven standards.

## Current Status (i)

- The Healthcare Informatics Standards
  Board (HISB), seven Standards
  Development Organizations (SDOs), and
  six other organizations are participating
  loading and enhancing a metadata registry.
- The Mayo Foundation is managing a HISB work unit that oversees the USHIK project.

## Current Status (ii)

- The Centers for Medicare & Medicaid Services and the Department of Defense, Health Affairs are providing operational support.
  - Funding to continue enhancements and operations for next year is now in place

## Current Status (iii)

- The National Institute of Health, National Cancer Institute will host the USHIK site (www.ushik.org).
- The National Institute of Health, National Cancer Institute is funding and collaborating on the development of an XML registry metadata exchange format based on ISO-11179 standard

## Current Status (iv)

## Participating SDOs are:

- Accredited Standards Committee X12
   Subcommittee N Insurance (X12N)
- American Dental Association (ADA)
- American Society for Testing and Materials
   Committee E31 on Healthcare Informatics (ASTM E31)

## Current Status (v)

## Participating SDOs are:

- Health Industry Business Communications Council (HIBCC)
- Health Level Seven (HL7)
- Medical Device Communications Industry Group (IEEE 1073)
- National Council for Prescription Drug Programs (NCPDP)

## Current Status (vi)

- Other participating organizations are:
  - Centers for Disease Control and Prevention (CDC)
  - Department of Defense, Health Affairs (DoD HA)
  - National Institute of Health, National Cancer Institute
  - National Committee on Vital and Health Statistics (NCVHS)

## Current Status (vii)

- Other participating organizations are:
  - Government Computer-Based Patient Record Project (G-CPR - Department of Defense, Health Affairs (DoD HA), Department of Veteran Affairs (VA), and Indian Health Service (IHS)
  - Centers for Medicare & Medicaid Services,
     End Stage Renal Disease Program (CMS ESRD)

# Metadata Loading Progress

Organization	Approximate Number	Mapped to NHIM	Comment		
1. National Council for Prescription Drug Programs (NCPDP)	441	Yes	Loaded		
2. Department of Defense, Health Affairs (DoD HA) – Glossary of Healthcare Terminology	778		User Input		
3. Accredited Standards Committee – X12 Subcommittee N – Insurance (X12N)	1145	In Progress	Loaded		
4. National Committee on Vital and Health Statistics (NCVHS)	42	Yes	Loaded		
5. Health Level (HL7)	409		Loaded		
6. Centers for Disease Control and Prevention (CDC)	31		Loaded		
7. Medical Device Communications Industry Group (IEEE 1073)			User Input		
8. American Society for Testing and Materials Committee E31 on Healthcare Informatics (ASTM E31)	909	In Progress	Loaded		
9. American Dental Association (ADA)	911		User Reformat		
10. Health Industry Business Communications Council (HIBCC)			User Input		
11. Government Computer-based Patient Record (G-CPR) Reference Terminology Model	356		Loaded		
12. Health Care Financing Administration, End Stage Renal Disease (HCFA ESRD)			User Input		
13. Department of Defense, Health Affairs (DoD HA) – Functional Area Model – Data	3291		Loaded		

# Metadata Loading Progress

Organization	Approximate Number	Mapped to NHIM	Comment
14. National Institute of Health, National Cancer Institute			User Input
(NIH-NCI)			
15. HIPAA Designated Code Sets		In Progress	
National Drug Code Directory	29		Loaded
Health Care Financing Administration Common Procedure	27		Loaded
Coding System (HCPCS)			
Logical Observation Identifier Names and Codes (LOINC)			Loaded
International Classification of Diseases, 9th Revision,	56		Loaded
Clinical Modification (ICD-9-CM)	3		

~8400

## Metadata Registry Overview

- A metadata registry is a place to keep facts about characteristics of data that are necessary to clearly describe, inventory, analyze, and classify data.
- A metadata registry supports data sharing with cross-system and cross-organization descriptions of common units of data.
- A metadata registry assists users of shared data to have a common understanding of a unit of data's meaning, representation, and identification.

#### Methods of **Finding Data Flements**

#### **Data Elements**

ABCDEFGH..

#### **Initiatives**

Health Insurance Portability and Accountability Act

#### **Data Collections**

**HCFA Long Term** Care **BRFSS** 

#### **Data Agreements**

Sex

X12 NCVHS Core Data NCPDF

#### **Organizations**

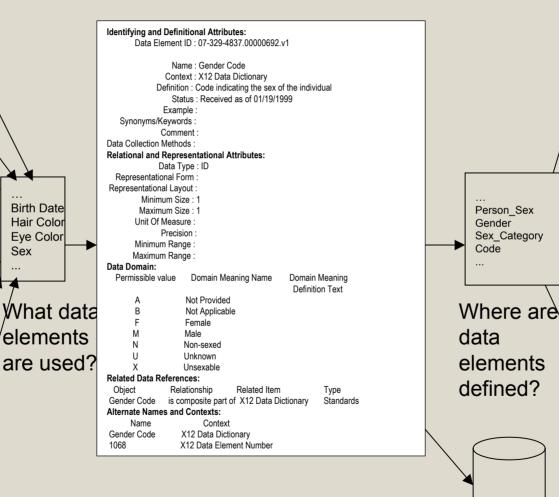
CDC **AHCPR NCVHS** 

#### Models

HI 7-RIM DoD HA FAM-D **AIHW** 

## **Metadata Registry Overview**

Data elements are described in common format



References to Authoritative Sources

NCPDP (National Council for Prescription Drug Program)

Data Element

X12 (American Standards Committee)

Transaction Set

-Data Element

-Composite Data Element

HL7 (Health Level

Seven)

Reference Information Model

Subject Area

-Class

-Attributes

NHIM (National

Health Information Model of Australia)

Model

Codes can be

applications.

downloaded for use in

-Model Subtype -Information Model

Subtype

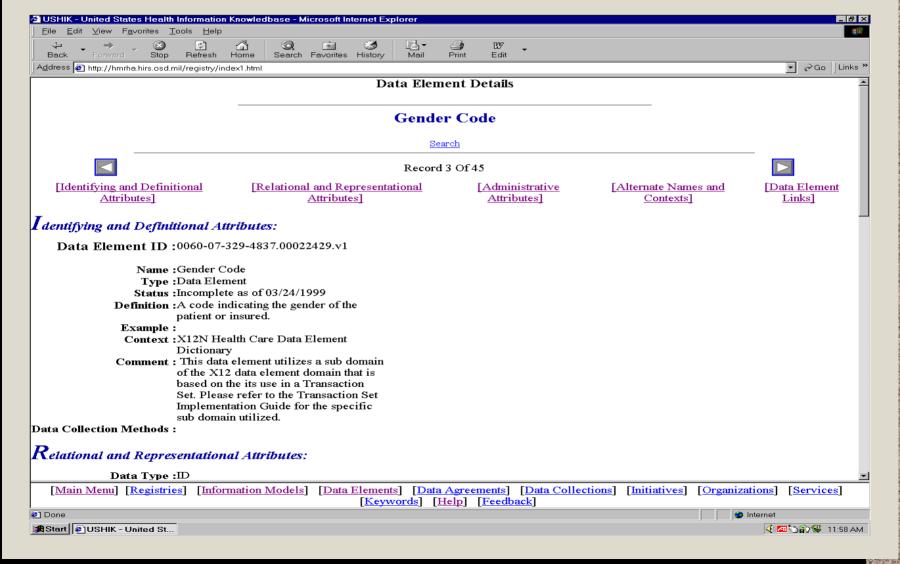
- -Data Element
- -Data Concept
- -Composite Data

Element

-Derived Data

Flement

### Data elements are described in common format (i)



### Data elements are described in common format (ii)

#### $m{I}$ dentifying and Definitional Attributes:

Data Element ID: 0060-07-329-4837.00022429.v1

Name: Gender Code

Type: Data Element

Status: Incomplete as of 03/24/1999

**Definition**: A code indicating the gender of the

patient or insured.

Example:

Context: X12N Health Care Data Element

Dictionary

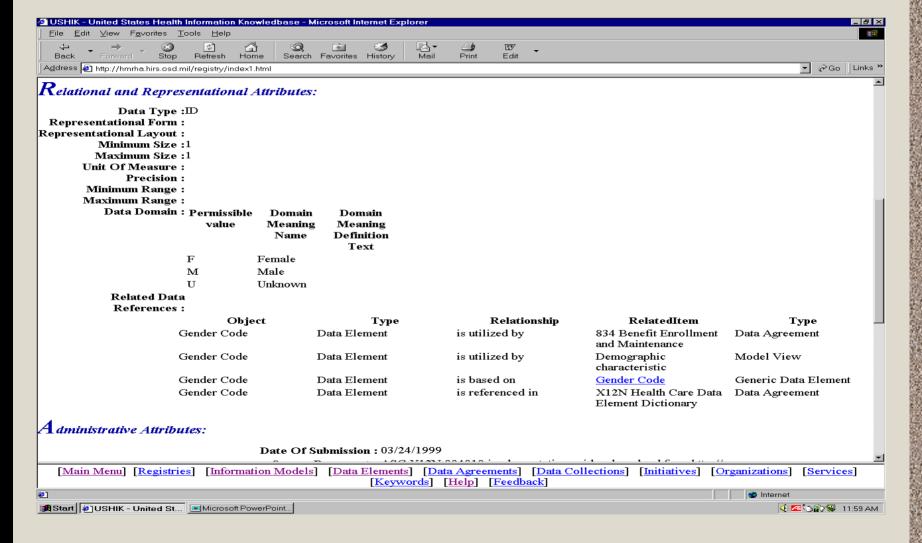
Comment: This data element utilizes a sub domain

of the X12 data element domain that is based on the its use in a Transaction Set. Please refer to the Transaction Set

Implementation Guide for the specific

sub domain utilized.

### Data elements are described in common format (iii)



### Data elements are described in common format (iv)

#### **K**elational and Representational Attributes:

Data Type :ID

Representational Form:

Representational Layout:

Minimum Size :1

Maximum Size :1

Unit Of Measure:

**Precision:** 

Minimum Range:

Maximum Range:

Data Domain : Permissible Domain Domain

value Meaning Meaning

Name Definition

Text

F Female

M Male

U Unknown

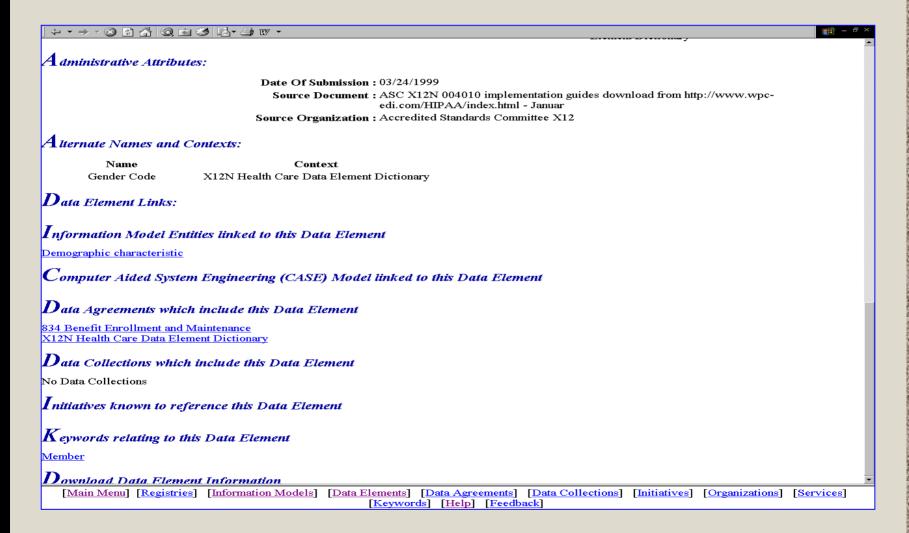
## Data elements are described in common format (v)

#### Related Data

#### References:

Object	Туре	Relationship	RelatedItem	Туре
Gender Code	Data Element	is utilized by	834 Benefit Enrollment and Maintenance	Data Agreement
Gender Code	Data Element	is utilized by	Demographic characteristic	Model View
Gender Code	Data Element	is based on	Gender Code	Generic Data Element
Gender Code	Data Element	is referenced in	X12N Health Care Data Element Dictionary	Data Agreement

### Data elements are described in common format (vi)



### Data elements are described in common format (vii)

#### A dministrative Attributes:

Date Of Submission: 03/24/1999

Source Document: ASC X12N 004010 implementation guides download from http://www.wpc-

edi.com/HIPAA/index.html - Januar

Source Organization: Accredited Standards Committee X12

#### $oldsymbol{A}$ Iternate Names and Contexts:

Name Context

Gender Code X12N Health Care Data Element Dictionary

### Data elements are described in common format (viii)

**D**ata Element Links:

Information Model Entities linked to this Data Element

Demographic characteristic

 $oldsymbol{C}$ omputer Aided System Engineering (CASE) Model linked to this Data Elem

 $m{D}$ ata Agreements which include this Data Element

834 Benefit Enrollment and Maintenance X12N Health Care Data Element Dictionary

 $m{D}$ ata Collections which include this Data Element

No Data Collections

Initiatives known to reference this Data Element

Keywords relating to this Data Element

<u>Member</u>

**D**ownload Data Flement Information

[Main Mannel [Desistation] [Information Medical [Deta Florents] [Deta Assessments]

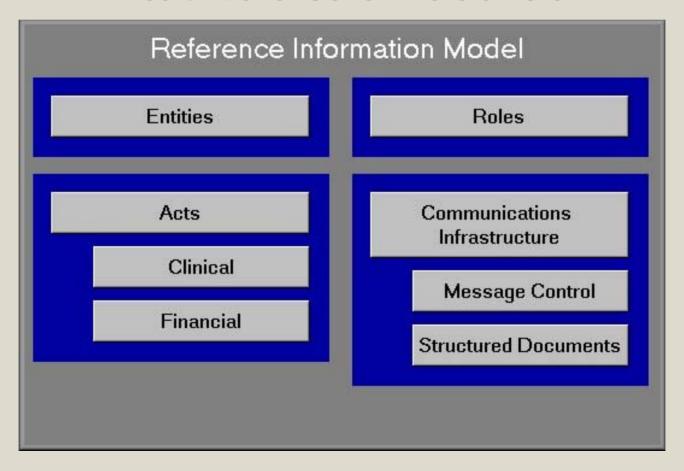
## High Level Graphics Provide Owners Perspective of Data Elements (i)

National Council for Prescription Drug Programs Version 1.2

Data Dictionary			
Batch Standard	Manufacturer Rebate		
Claim Payment Tape Format	Member Enrollment		
Claims Billing Tape Format Prior Authorization			
Diskette Billing Format	Telecommunication		
Health Insurance Portability and Accountability Act (HIPAA) Standards			
Telecommunication Standard Format, Version 5.1			
Batch Standard Format, Version 1.0			

# High Level Graphics Provide Owners Perspective of Data Elements (ii)

Health Level Seven Version 3.0



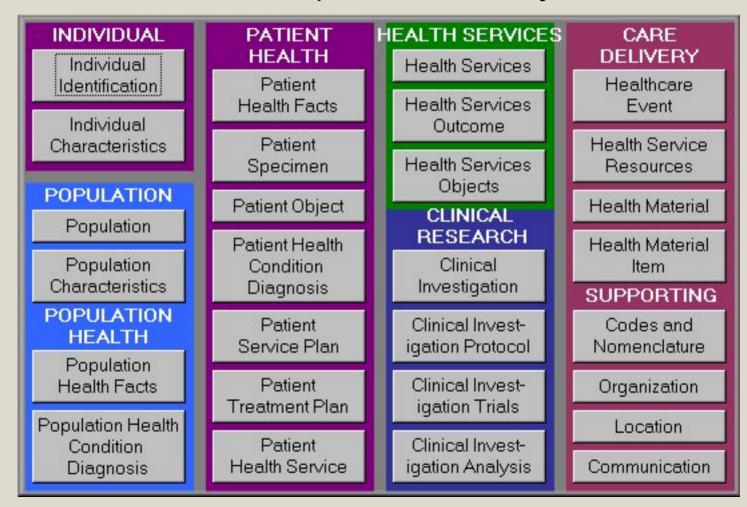
# High Level Graphics Provide Owners Perspective of Data Elements (iii)

Accredited Standards Committee - X12 Subcommittee N - Insurance (X12N)



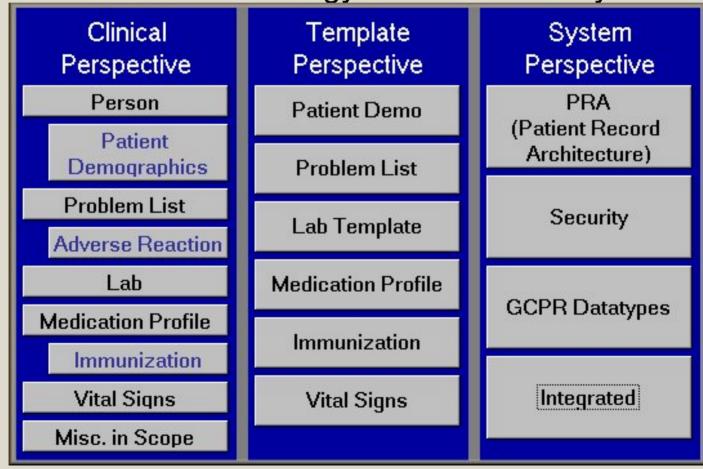
# High Level Graphics Provide Owners Perspective of Data Elements (iv)

ADA/ANSI 1000 Specification Subject Areas



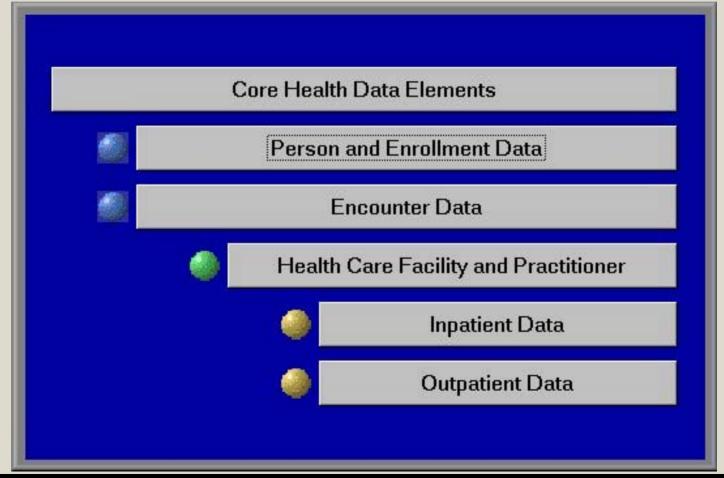
# ligh Level Graphics Provide Owners Perspective of Data Elements (v)

Government Computer-based Patient Record (G-CPR)
Reference Terminology Model - February 2001



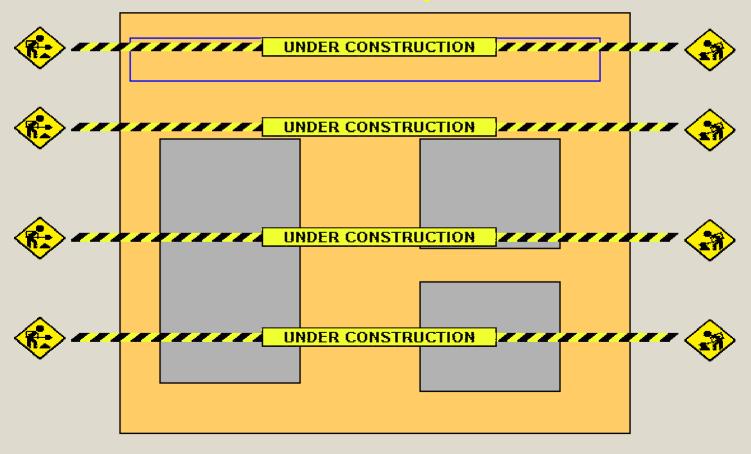
# High Level Graphics Provide Owners Perspective of Data Elements (vi)

National Committee on Vital and Health Statistics Core Health Data Elements - August 1996



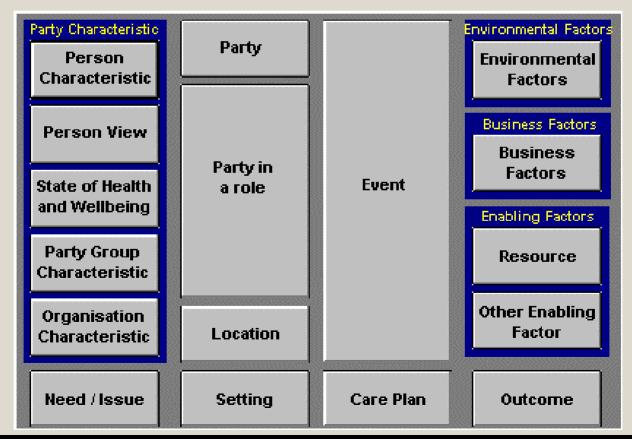
# High Level Graphics Provide Owners Perspective of Data Elements (vii)

#### Another Perspective

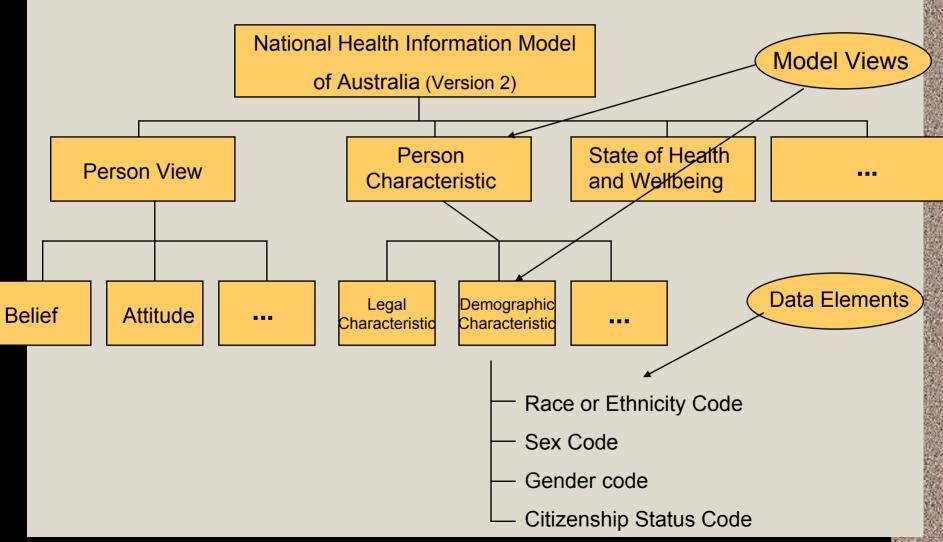


# USHIK Uses NIHM to Group Data Elements National Health Information Model of Australia (NIHM)

(Version 2)



# USHIK Data Elements are Mapped to NHIM Model Views



# Data Elements Mapped by Different Organizations Appear Together

#### **Data Elements For Demographic characteristic**

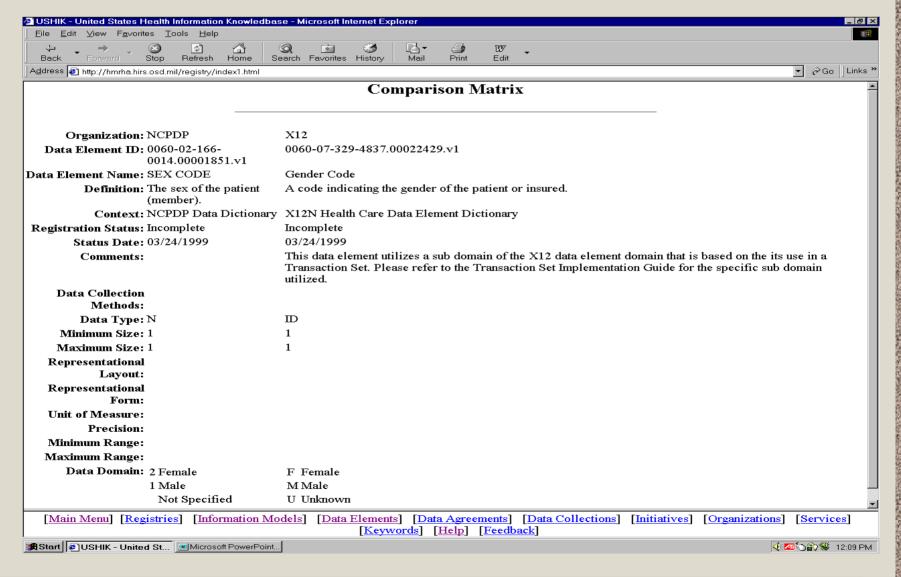
#### **Data Elements**

Swap to Advanced Searc X12 Data Element (0060-07-329- 4837 Registration Authority)

Data Elements for Model Demographic characteristic

Data Element	Matri	ix Registration Authority	ID	Vers	Туре	Status	
Citizenship Status Co		0060-07-329-4837	00021307	1	Data Element I	ncor NCF	PDP Data Element
DATE OF BIRTH		0060-02-166-0014	00001002	1	Data Element In	ncor (006	0-02-166-0014
Gender Code	✓	0060-07-329-4837	00022429	1	Data Element In	ncor Reg	istration Authority)
Race or Ethnicity Co	<u>ode</u> □	0060-07-329-4837	00023786	1	Data Element Ir	ncor	
SEX CODE		0060-02-166-0014	00001851	1	Data Element II	ncomplete	
Matrix Report	Select All	Clear All Add To List	Clear lis	st	Download		

#### Comparison Matrix Aids in Harmonizing Data Elements



#### **Future**

- Loading of metadata into USHIK is continuing.
- A downloading capability which allows organizations to have some control over what is downloadable will be established.
- Method of versioning information are being formulated.
- New capabilities are being documented via Use Cases.
- HISB will manage the release of the new USHIK.

#### USHIK Metadata Registry

	Purpose	Value	Benefit
Describe data using common characteristics.	Promote development of good definitions of data.	Assists users of shared data to have a common understanding of a unit of data's meaning, representation, and identification.	Insures data quality of shared information.
Provide multiple ways to locate data definitions.	Provide both standard and custom 'drill-down' methods to data definitions.	Recognizes different points of view to narrow and focus on data definitions to be retrieved.	User not overwhelmed by number of data definitions.
Web accessible and data definitions downloadable.	Provide easy access and promote use of standards.	Good data definitions become standards.	Standards are re-used. Interoperability between system is easier and data quality improvements.
Able to link to information in other data registries.	Utilize data elements described by experts in their particular field.	Quality data elements that cover the breath of a field are created.	Resources are not used to recreate data elements.

#### **Demonstration**

#### Demonstration

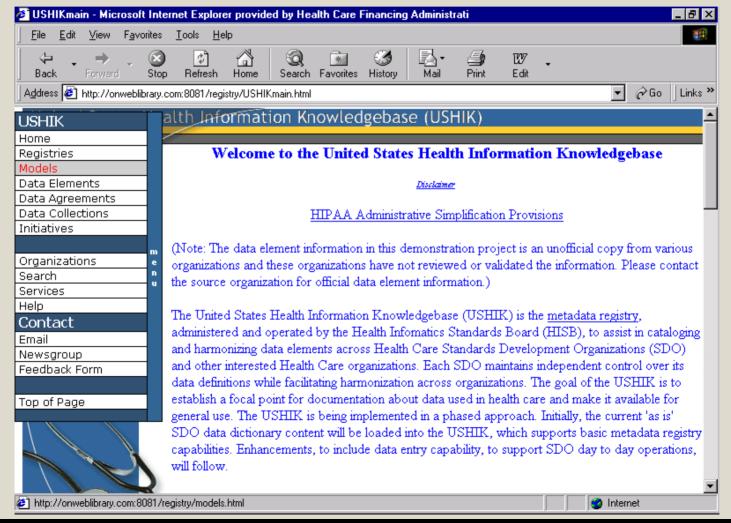
- How to use USHIK metadata registry
  - Using an organization's information model along with data element mapping to find similar data elements
  - Search and comparing data elements
- Viewing data element based on Health Insurance Portability and Accountability Act (HIPAA) groupings

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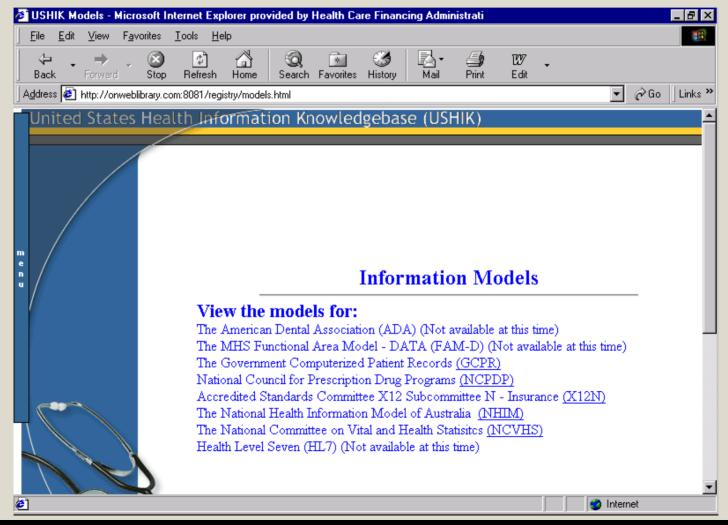
#### How to use USHIK metadata registry

- Using an organization's information model along with data element mapping to find similar data elements
  - Drill down from an organization's information model
  - Find a data element on interest
  - Review the data element's mapping to information models
  - Transfer to the NHIM mapped information model
  - View data elements mapped to that information model
  - Select and compare data elements on interest

### Using an organization's information model Select "Models" from side bar menu

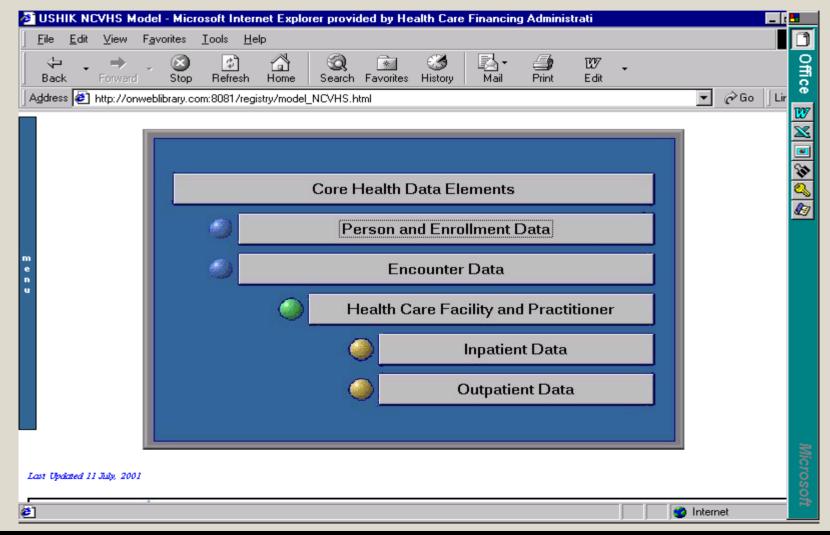


### Using an organization's information model Click on "NCVHS" information model

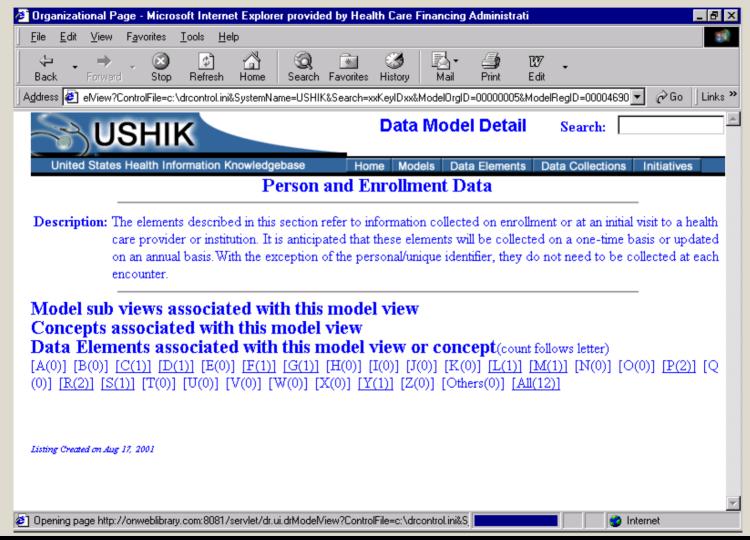


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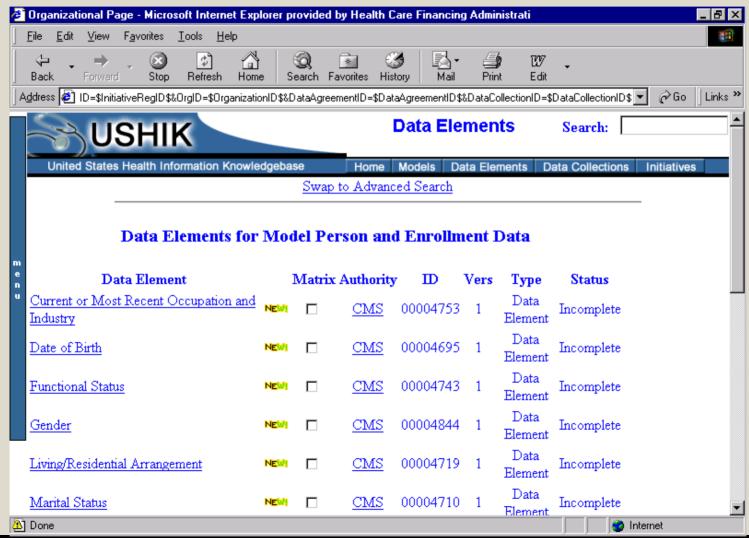
### Using an organization's information model Click on "Person and Enrollment Data"



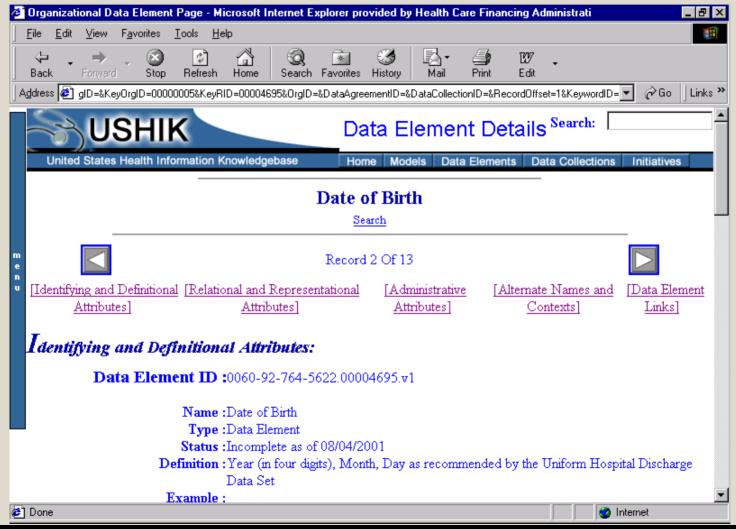
### Using an organization's information model Click on "All(12)" to display all data elements



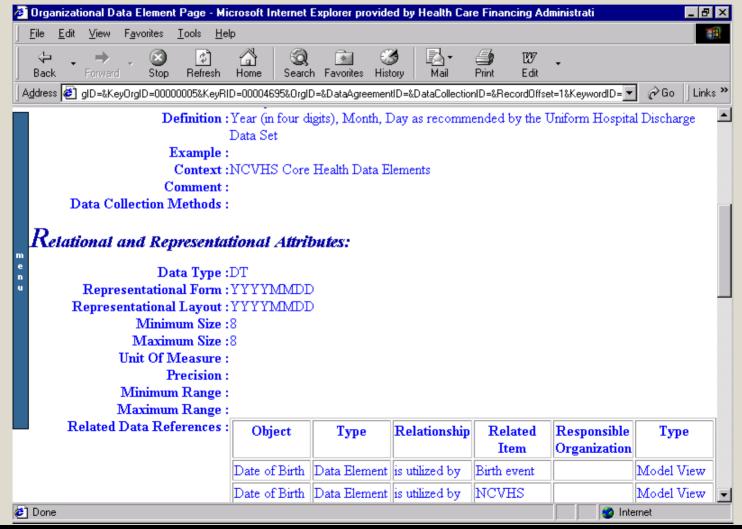
### Using an organization's information model Click on "Date of Birth" to display its metadata



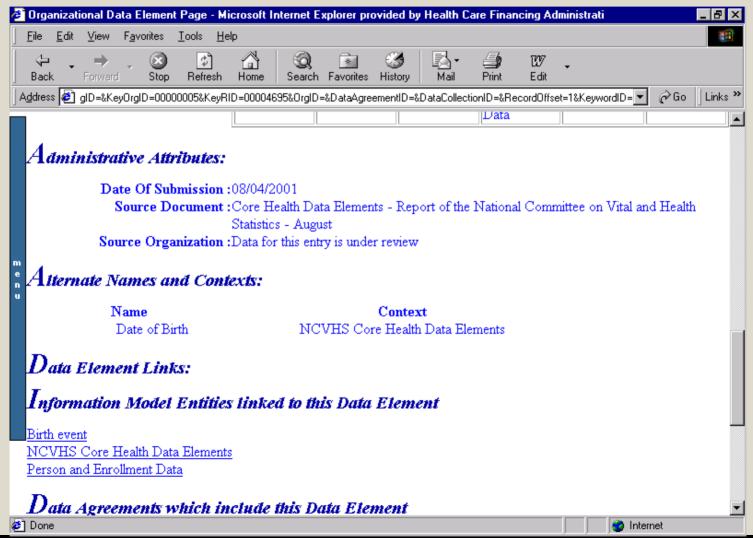
#### Scroll down to see additional metadata



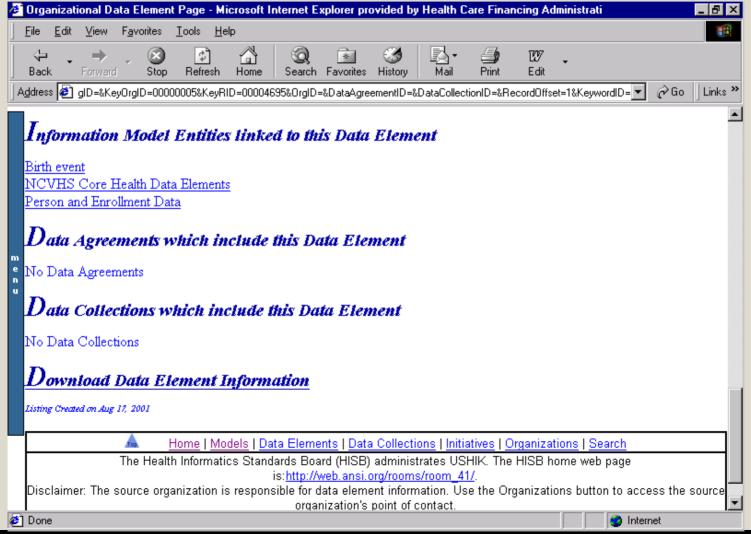
### Using an organization's information model Scroll down to see additional metadata



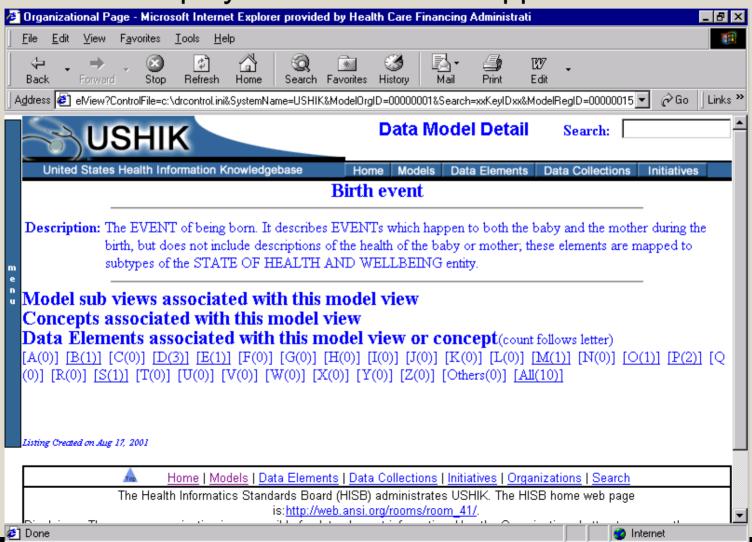
### Using an organization's information model Scroll down to see additional metadata



### Using an organization's information model Click on "Birth event" to see data elements mapped to it



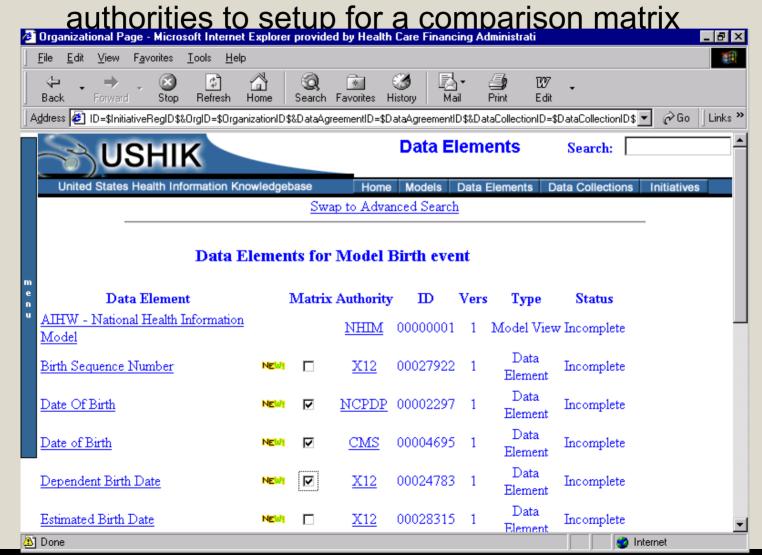
Australian Model view "Birth Event" is displayed. Click on All(10) to display data elements mapped to it.



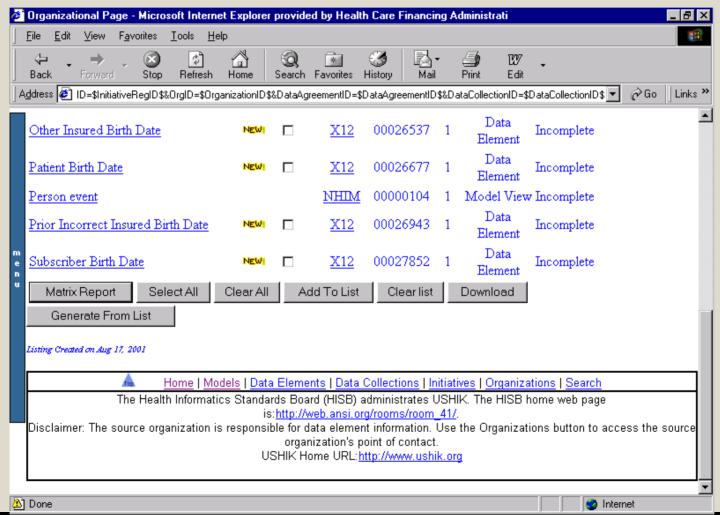
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Click on matrix check box next to Date of Birth and Dependent Birth Data data elements in NCPDP, CMS, and X12 registry

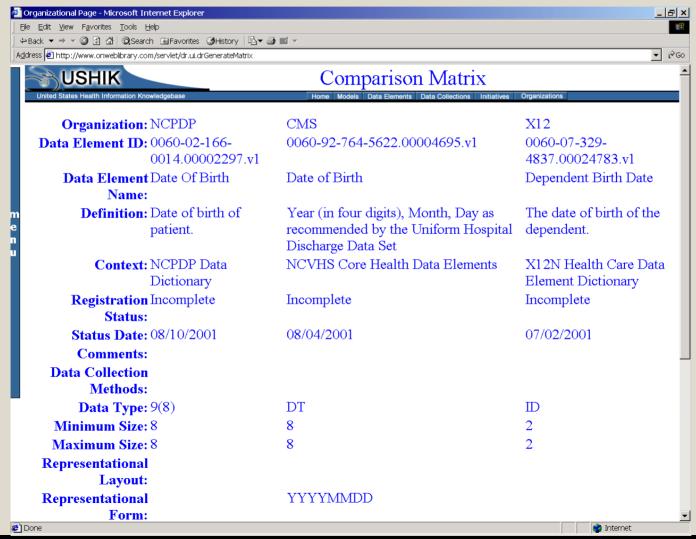


Scroll to bottom of page and click on "Matrix Report" button to display the comparison matrix report



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### Using an organization's information model Comparison matrix report is displayed

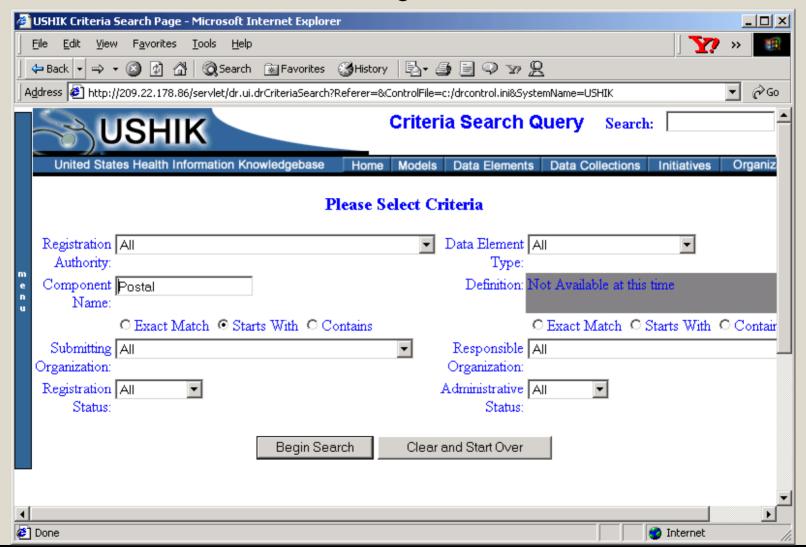


#### How to use USHIK metadata registry

#### Search and comparing data elements

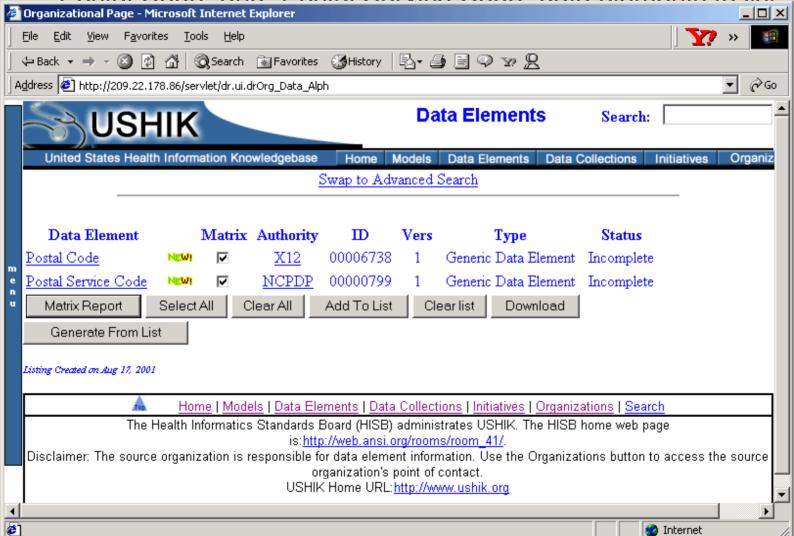
- This example shows the use of the registry to compare data elements that may be the same, but are named differently.
- Use "search" and "add to list" capabilities to compare "Postal" and "Zip" codes
- Search for data elements starting with "Postal"
- Add them to a list
- Search for data elements starting with "Zip"
- Add them to the list
- Compare the data elements on the list

Click on Search in side bar menu, then type "Postal", select "Starts with" and then click "Begin Search" button

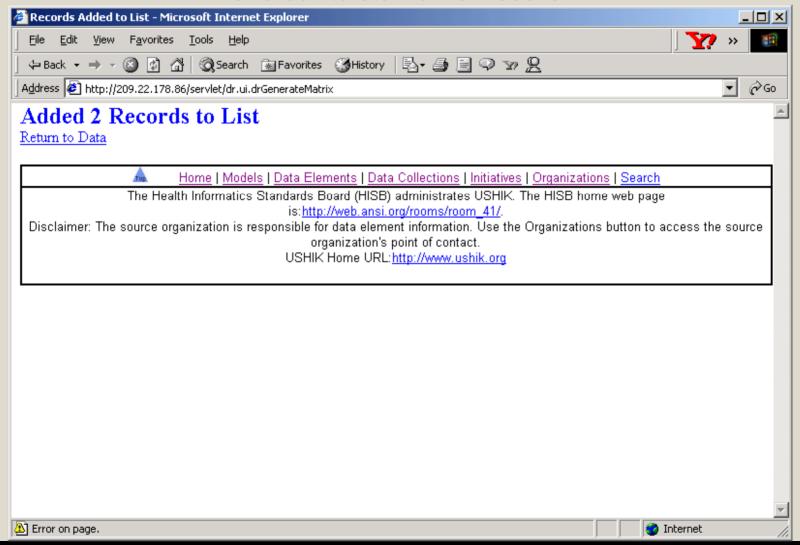


Click on check boxes under "Matrix" and the "Add to List" button to add

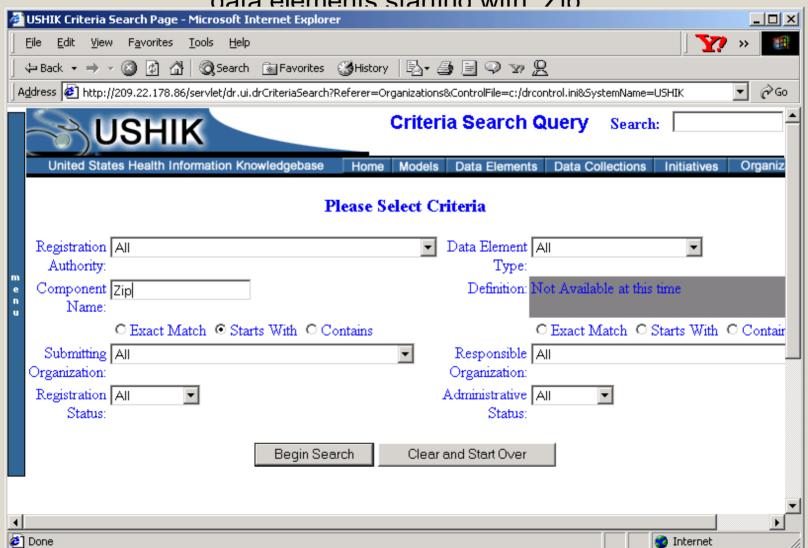
"Postal Code" and "Postal Service Code" data elements to list



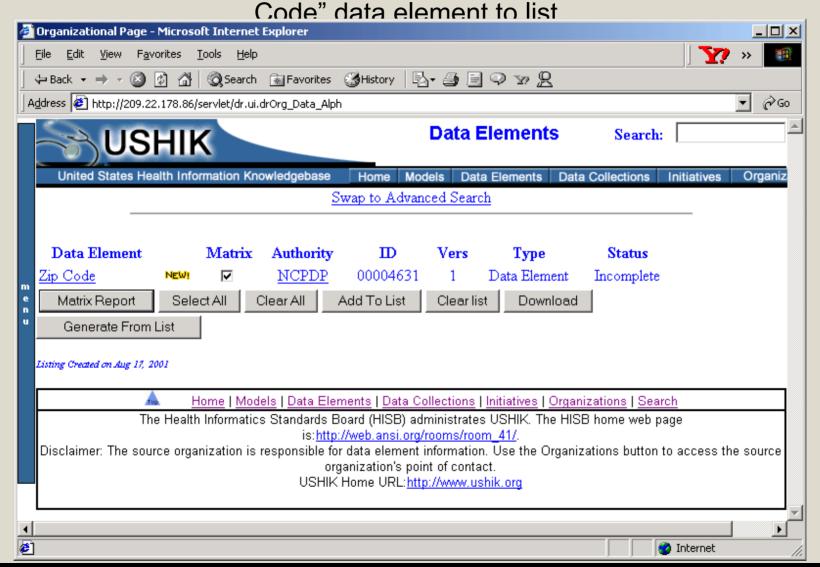
Added 2 records to list is reported. Click on "Search" button on bottom menu bar to start a new search.



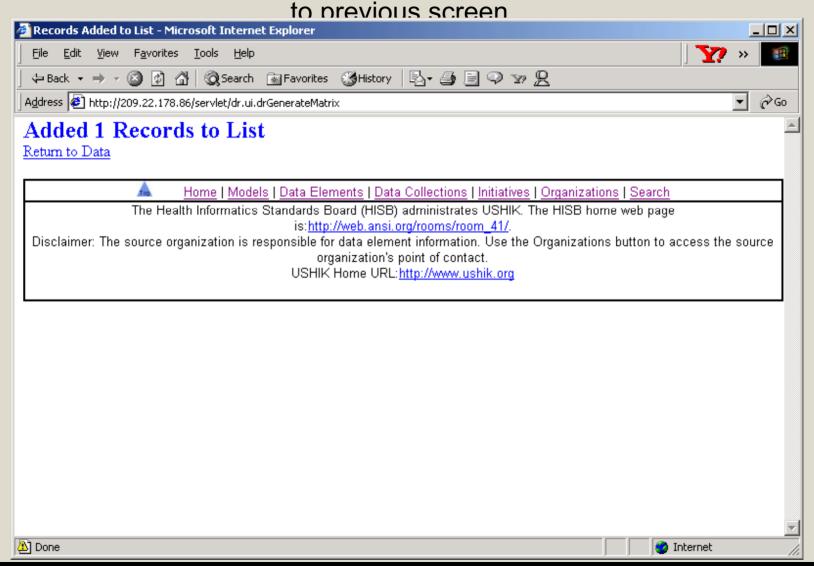
Type "Zip", select "Starts With" and click "Begin Search" to search for data elements starting with "Zip"



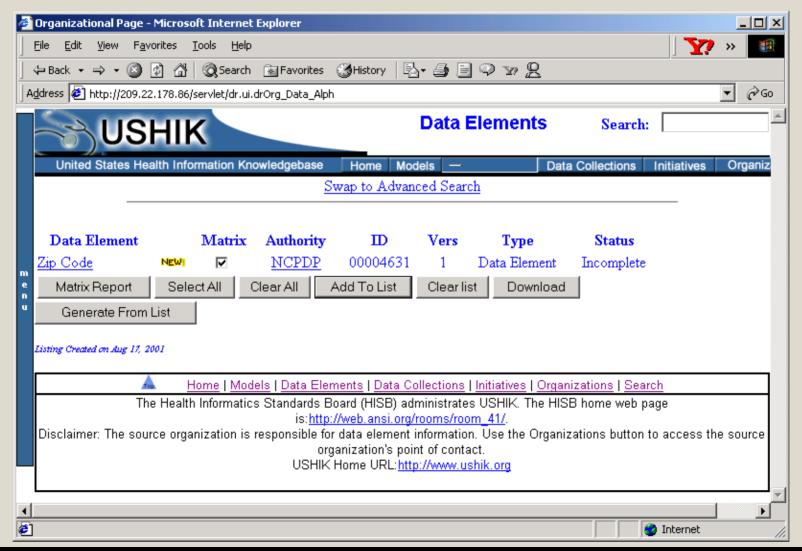
Click on check box under "Matrix" and the "Add to List" button to add "Zip



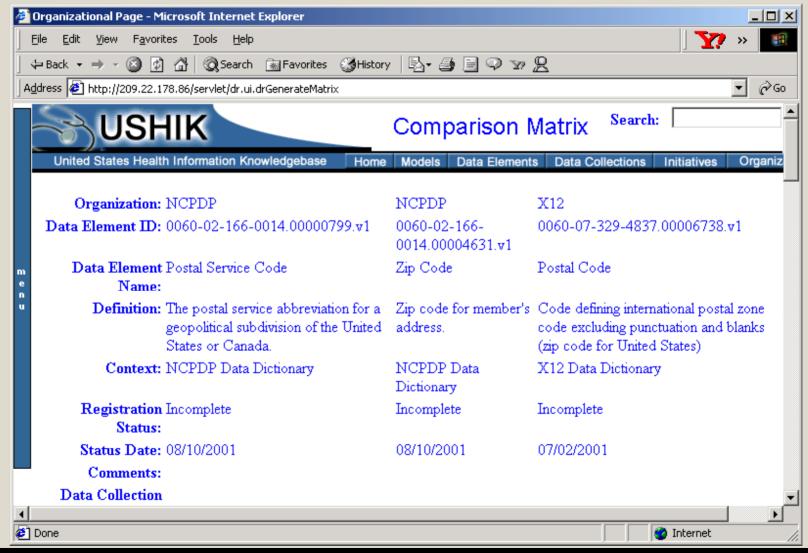
Added 1 records to list is reported. Click on browser "Back" button to get



Click on "Generate From List" button to display a comparison matrix.

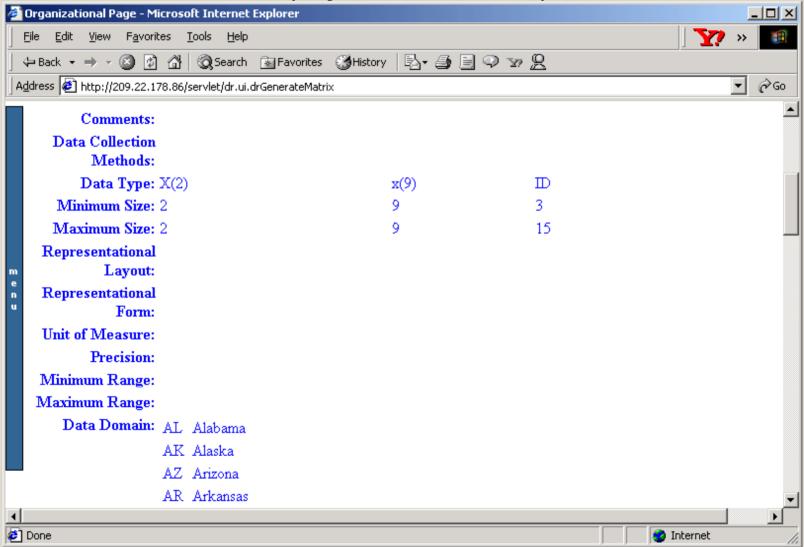


Comparison matrix is displayed.



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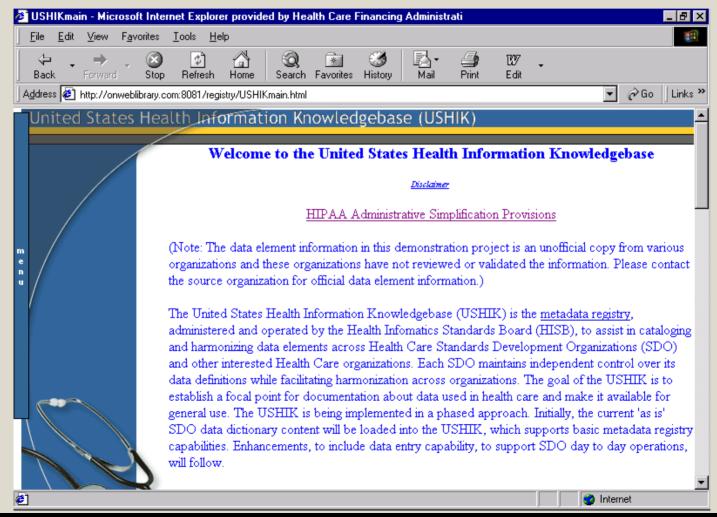
Scroll down to display more of the comparison matrix.



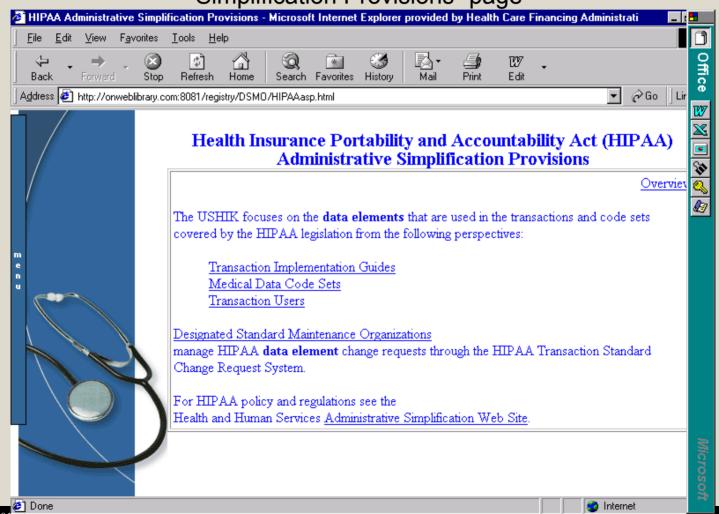
# Viewing data element based on Health Insurance Portability and Accountability Act (HIPAA) groupings

- Viewing data elements based on transaction guides
- Viewing data elements based on transaction users

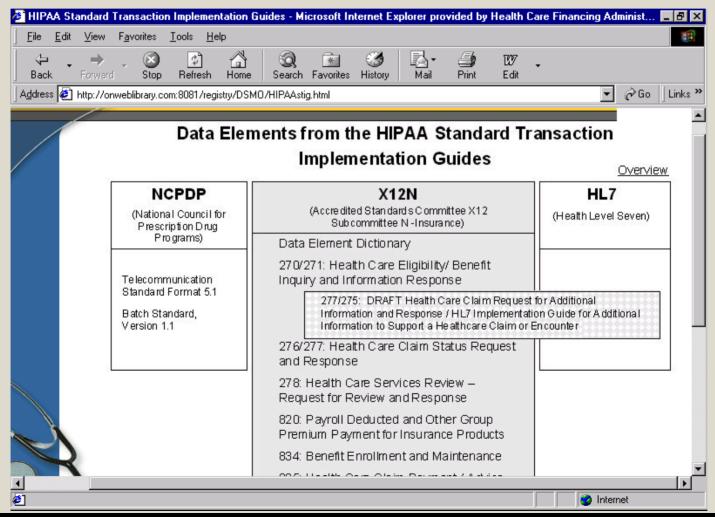
Select "HIPAA Administrative Simplification Provisions" on the Home page



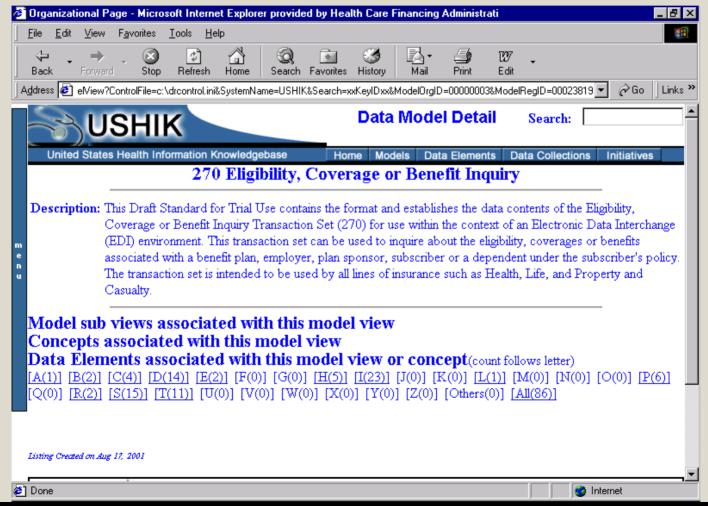
Click on "Transaction Implementation Guides" on "HIPAA Administrative Simplification Provisions" page



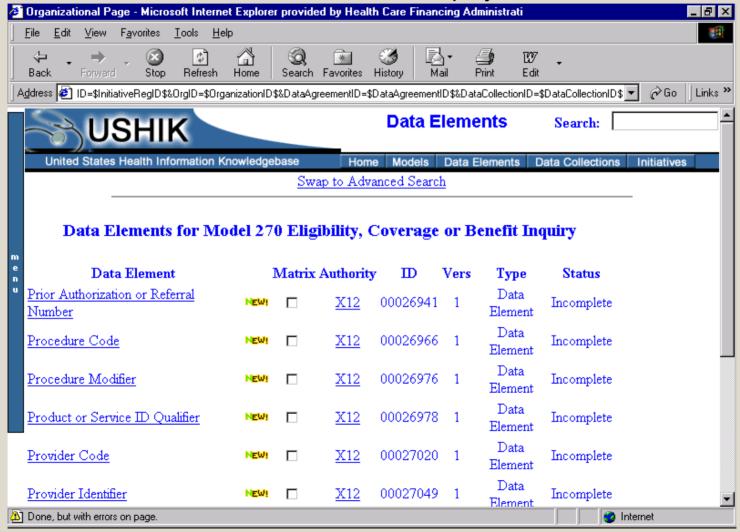
Click on "270" to display Health Care Eligibility / Benefit Inquiry data elements



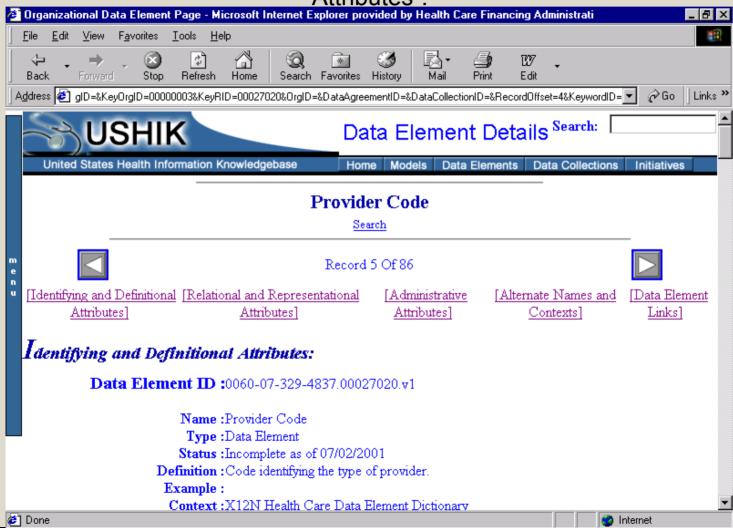
Click on "P(6)" to display data elements starting with "P"



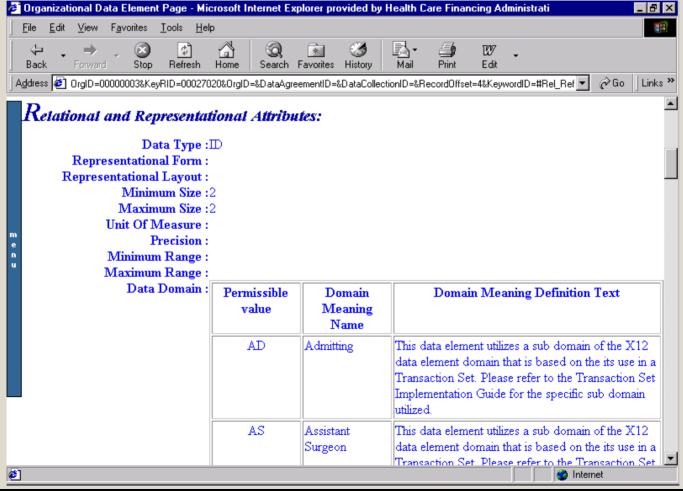
Click on "Provider Code" to display its metadata



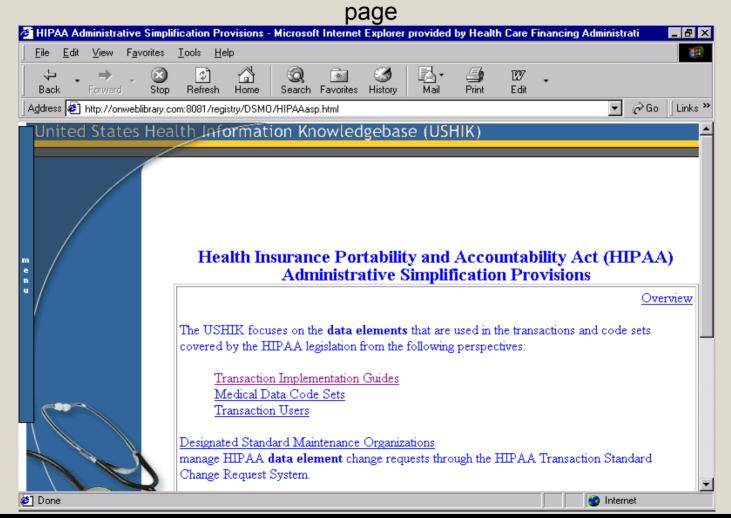
"Provider Code" metadata is displayed. Click on "Relational and Representational Attributes".



"Relational and Representational Attributes" type metadata for "Provider Code" is displayed.



Click on "Transaction Users" on "HIPAA Administrative Simplification Provisions"

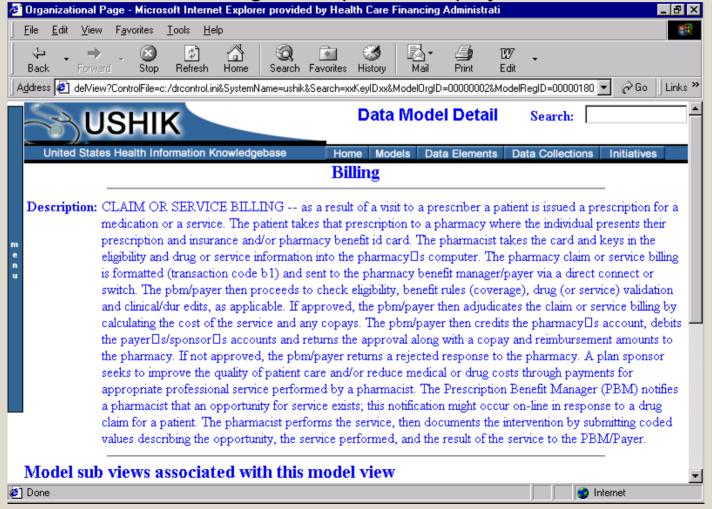


Click on "B1" (Claim or Service Billing transaction between "Enrollment" and

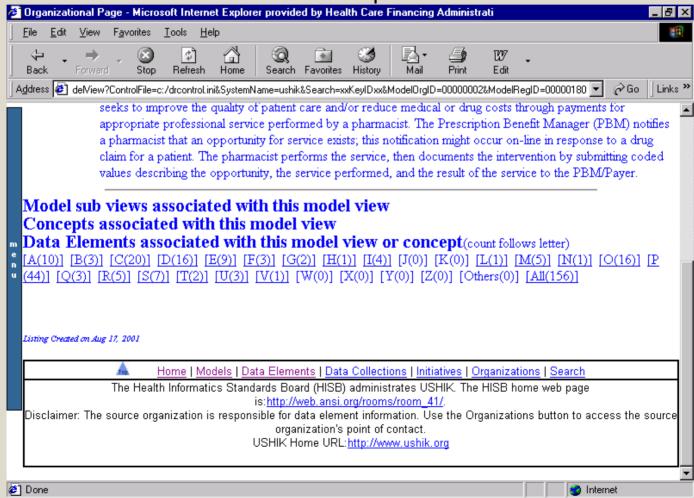
"Eligibility Verification") on "HIPAA Transaction Users" page 🗃 HIPAA Transaction Users - Microsoft Internet Explorer provided by Health Care Financing Administrati Favorites Tools Search Favorites Edit Address 💋 http://onweblibrary.com:8081/registry/DSMO/HIPAAtu.html HIPAA Transaction Users Overview Providers Health Plans Sponsors Pharmacy Provider Provider Provider Information information Information Subscriber Subscriber Information 271 275 Information Information Premium Premium BIII ealth Service aith Service **E**iaibility C1 Verification Reg Add'l la Enrollment P1 Claim or Service Billing 837 Prior m/Encounte Authorization Information Claim or cceptance Service or Claim Claim Adjudication Information Status Status 277 History (& Plan 835 COB rofessional Parameters daim/Encount Services http://onweblibrary.com:8081/servlet/dr.ui.drModelView?ControlFile=c:/drcontrol.ini&SystemName=ushik&Search=xxKeyID

Internet

"Billing" description is displayed.



Scroll down to bottom of page to get access to select "Billing" data elements based on alphabet.



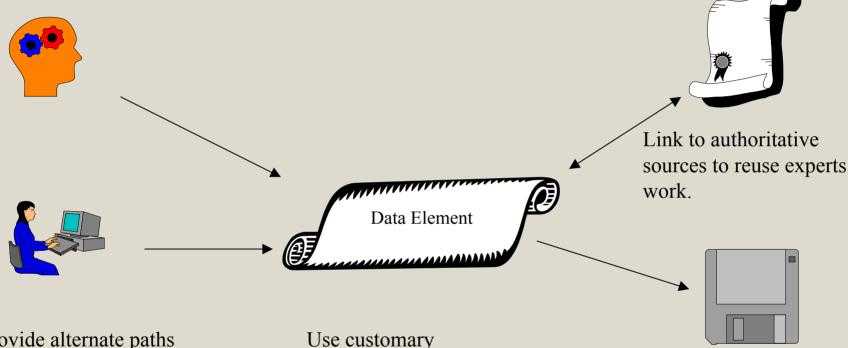
# End of Demonstration on following:

- How to use USHIK metadata registry
  - Using an organization's information model along with data element mapping to find similar data elements
  - Search and comparing data elements
- Viewing data element based on Health Insurance Portability and Accountability Act (HIPAA) groupings

#### USHIK Metadata Registry

	Purpose	Value	Benefit
Describe data using common characteristics.	Promote development of good definitions of data.	Assists users of shared data to have a common understanding of a unit of data's meaning, representation, and identification.	Insures data quality of shared information.
Provide multiple ways to locate data definitions.	Provide both standard and custom 'drill-down' methods to data definitions.	Recognizes different points of view to narrow and focus on data definitions to be retrieved.	User not overwhelmed by number of data definitions.
Web accessible and data definitions downloadable.	Provide easy access and promote use of standards.	Good data definitions become standards.	Standards are re-used. Interoperability between system is easier and data quality improvements.
Able to link to information in other data registries.	Utilize data elements described by experts in their particular field.	Quality data elements that cover the breath of a field are created.	Resources are not used to recreate data elements.





Provide alternate paths for different types of users to locate data element information.

characteristics based on an international standard to describe data elements.

Provide access to data element characteristics and code sets via web for downloading and reuse in application development.